

National Institute of Environmental Health Science Signature Project

Bisphenol A: Research to Impact Human Health

Bisphenol A (BPA) is a high production, estrogenic endocrine-disrupting chemical used primarily in the production of polycarbonate plastics and epoxy resins. There is significant human exposure, as detectable levels of BPA have been found in 93% of urine samples collected from people 6 years and older. The estimated amount of BPA ingested by humans is in the same range as doses that have been shown to cause a variety of diseases and dysfunctions in animal models. Independent literature reviews were recently conducted by the National Toxicology Program's Center for the Evaluation of Risks to Human Reproduction (CERHR) and by experts at an NIEHS-sponsored workshop (more than 700 publications reviewed). Both reports came to the conclusion that there is evidence from animal studies that BPA may be causing adverse effects at levels to which humans are exposed, and it was also noted that there were significant data gaps that needed to be filled. A significant portion of the literature was not able to be fully considered in the NTP evaluation due to a variety of experimental limitations including the use of a single dose, small numbers of animals per group, non-oral route of administration, lack of proper statistics and lack of data on specific phenotypic endpoints.

This signature project focuses on developing new data in a limited number of strategic areas where there is a paucity of data and on stimulating the replication and expansion of published studies that have been deemed by CERHR to have specific deficiencies. Under this program, two-year animal or human studies that focus on either developmental exposure (*in utero* or neonatal) or adult chronic exposures to low environmentally relevant doses of BPA will be supported through the Grand Opportunities (GO) Grant program and the Challenge Grant program, as well as by supporting meritorious investigator-initiated applications that have been previously reviewed but could not be funded for budgetary reasons.

The endpoints of interest include but are not limited to obesity, diabetes, and metabolic syndrome; reproductive disorders and reproductive system cancers; disorders of the developing immune; cardiovascular diseases; and phenotypic changes following exposure in one generation that persist for 2 or more subsequent generations. Population-based studies that have the ability to explore the link between developmental exposures to BPA (determined by analysis of cord blood or maternal blood levels of total and free BPA or urinary BPA) and health outcomes listed above are of particular interest given the paucity of data in this area. The use extant datasets with banked specimens and relevant outcome data as well as existing longitudinal studies to complete new analyses on the human health effects of BPA exposure during pregnancy and/or the neonatal and the prepubertal period are encouraged.